



UNITED STATES
DEPARTMENT OF
AGRICULTURE

RURAL
DEVELOPMENT

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SFH SECTION

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Rural Development Texas AN No. 569 (1924)

September 3, 2002

SUBJECT: Building Plans and Specification Requirements for
Single Family Housing (RD Instruction 1924-A)

TO: All Offices
USDA Rural Development, Texas

PURPOSE/INTENDED OUTCOME: The purpose of this Texas Administrative Notice (AN) is to define and clarify plan certification requirements for single family housing (SFH) dwellings. Specifically, it addresses development plans, building specifications, foundation plans, and certification requirements for Section 502 direct and guaranteed loans.

COMPARISON WITH PREVIOUS AN: There are no previous ANs on this subject.

BACKGROUND: Currently, USDA Rural Development requires homebuilders to provide a certification indicating that construction plans and specifications meet the requirements of CABO (Council of American Building Officials) One- and Two-Family Dwelling Code and CABO MEC (Model Energy Code) of 1992.

The Legislature of the State of Texas, through the enactment of Senate Bill 365, has adopted the 2000 International Residential Code (IRC) as it existed on May 1, 2001, as the municipal residential building code in the state. The Act took effect January 1, 2002. The International Residential Code is a simplified residential building code like the CABO (Council of American Building Officials) One- and Two-Family Dwelling Code, and applies to all construction, alteration, remodeling, enlargement, and repair of residential structures in a municipality.

Senate Bill 5 adopted the provisions of the International Residential Code as it existed on May 1, 2001, as Texas' energy code for single-family residential construction. The language in Chapter 11 (Energy Efficiency) of the 2000 International Residential Code for One- and Two-Family Dwellings, contemplates the whole house concept of measuring energy efficiency and not one measured component by component. Any reduction in the energy efficiency should be adjusted by a higher degree of energy conservation in another performance standard of the construction.

EXPIRATION DATE: July 31, 2003

FILING INSTRUCTIONS:
Following RD Instruction 1924-A

The International Residential Code does not apply to the installation and maintenance of electrical wiring and related components. The National Electric Code (NEC), as it existed on May 1, 2001, was adopted as the municipal residential electrical construction code in the state and applies to all residential electrical construction applications.

IMPLEMENTATION RESPONSIBILITIES: To comply with the state statutes and attain consistency with the standards of the residential construction industry in Texas, USDA Rural Development has adopted the 2000 International Residential Code (IRC) for One- and Two- Family Dwellings and the National Electric Code (NEC) as the development standards for USDA Rural Development Single Family Housing Programs in Texas. The adoption of the IRC and NEC will apply to the Section 502 Direct and Guaranteed Rural Housing loan programs.

For single family housing loans, building plans and specifications must be certified as meeting the requirements of the 2000 International Residential Code (IRC) for One- and Two- Family Dwellings and the National Electric Code (NEC). Required building plans and specifications shall be in accordance with RD Instruction 1924-A, Exhibit C.

Form RD 1924-25, "Plan Certification" should be completed and signed by the plan certifier for 502 Direct loans. Acceptable plan certifiers are listed in 1924.5 (f)(1)(iii) of RD Instruction 1924-A. This certification does not encompass the plot (site) plan, foundation plan, or soil bearing characteristics of the site. Certification of building plans and specifications does not validate the use of individual foundation plan designs. Individual engineered foundations must bear the seal and signature of a registered professional engineer.

The acceptability of plot plans and foundation plans for Section 502 Direct Loans remains the responsibility of USDA Rural Development.

Because of the adverse soil conditions in Texas, USDA Rural Development recognizes two options for the design of single family housing concrete slabs for Section 502 Direct Loans:

OPTION 1. A standard design for Texas prepared by USDA Rural Development based on the soil plasticity index (P.I.). The P.I. range for the soil may be obtained from the USDA, Natural Resource Conservation Service soil survey. In determining the plasticity index, a depth of 60 inches should be evaluated. The upper limit of the published P.I. range should be used for selecting one of the standard foundation designs.

Attachment 1 to this AN contains "Foundation Details" for Types A, B, C, D, Amarillo Area, and Lubbock Area Slabs.

OPTION 2. An individual design for each dwelling and site by a registered professional engineer. The engineered foundation plans shall be sealed by a professional engineer registered in Texas and accompanied by soils boring information from a certified, qualified testing laboratory. The design engineer shall also inspect the foundation preparation prior to placement of the concrete and provide a follow-up certification that the foundation was constructed in accordance with plans and specifications. A post tension foundation is considered an individual design and an engineered foundation. For post tension foundations, the design engineer shall inspect the foundation preparation prior to placement of concrete and at the time of cable tensioning. Cables should be pre-tensioned and then tensioned to capacity when concrete reaches design strength.

For Guaranteed Rural Housing (GRH) loans, Form RD 1924-25, "Plan Certification" or a comparable plan certification form (i.e. Form HUD-92541, "Builder's Certification of Plans, Specifications, & Site") may be used. Lenders must certify that new dwellings financed with a guaranteed loan have been built in accordance with building plans and specifications that contain approved building code certifications. The certification will ensure that the building plans and specifications meet the appropriate USDA Rural Development standards (IRC and National Electric Code). Given that the (IRC) addresses foundation plan designs, GRH lenders will not be required to comply with Options 1 or 2 for slab designs.

The Texas "Single Family Housing Construction Guide" may be used as a reference and to familiarize and assist USDA Rural Development personnel with understanding residential construction. It is not intended to supercede USDA Rural Development regulations or the adopted Agency development standards (IRC and National Electric Code). Builders will be required to construct houses in accordance with the 2000 International Residential Code for One- and Two- Family Dwellings (IRC) and the National Electric Code (NEC); not the Single Family Housing Construction Guide.

Please contact Scooter Brockett or Danny Torres in the Single Family Housing Section, if you have any questions.

///Signed///

BRYAN DANIEL
State Director

Attachment

Concrete Foundations

Concrete foundations shall be constructed using a minimum 3000 psi compressive strength concrete (28 day strength). The minimum cement requirement for concrete used in flat work is 5 sacks per cubic yard (470 lb.) for 1 1/2" maximum size aggregate, and 5 1/2 sacks per yard (520 lb.) for 1" maximum size aggregate. Maximum amount of water for non-air-entraining, 5 sacks, is 6.6 gallons (55 lb.) per sack of cement or 33 gallons (273 lb.) per cubic yard. Maximum amount of water for non-air-entraining, 5 1/2 sack mix, is 6.6 gallons (55 lb.) per sack of cement or 36 gallons (302 lb.) per cubic yard. The maximum water-cement ratio is 0.58.

Curing should begin as soon as possible after completion of concrete work. Curing is needed to maintain the concrete at a relatively constant temperature and prevent loss of moisture for the time necessary for proper hydration of the cement and strength gain of the concrete.

Curing Methods and Materials

Concrete can be kept moist (and in some cases at a favorable temperature) by two curing methods:

1. Methods that maintain the presence of mixing water in the concrete during the early hardening period. These include ponding or immersion, spraying or fogging, and saturated

wet coverings. Such methods afford cooling through evaporation, which is beneficial in hot weather.

2. Methods that prevent loss of mixing water from the concrete by sealing the surface. This can be done by covering with impervious paper or plastic sheets, or by applying membrane-forming curing compounds.

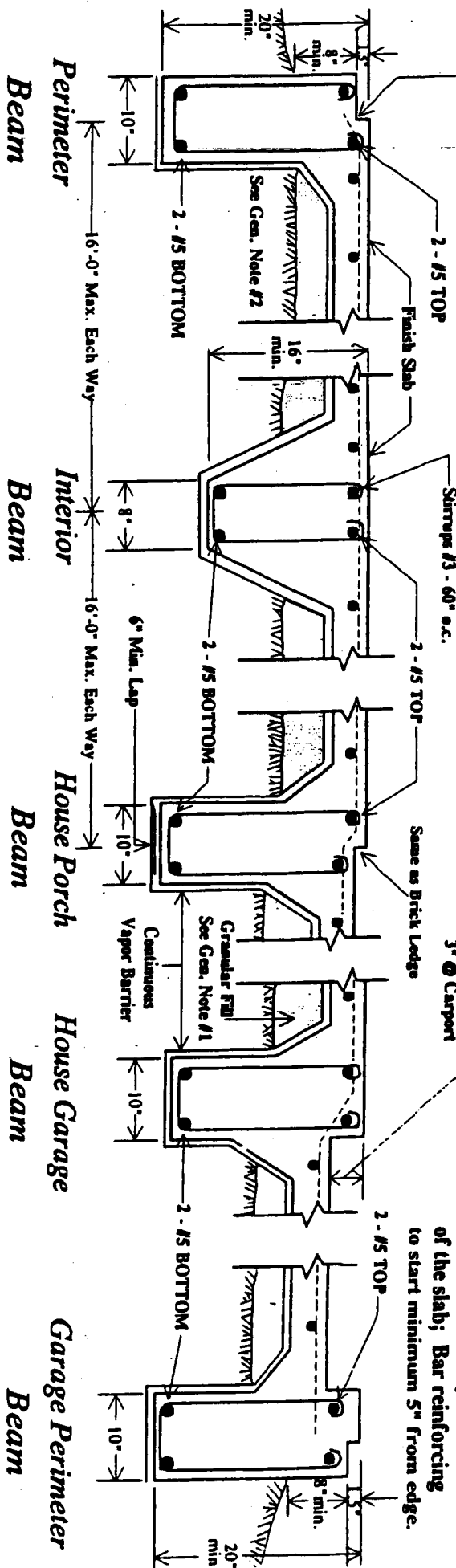
The method or combination of methods chosen depends on such factors as availability of curing materials, shape and size of concrete surface, aesthetic appearance, and economics.

Refer to Table 3-1 for foundation rebar dimensions.

Elevation Control Points (Tolerances)

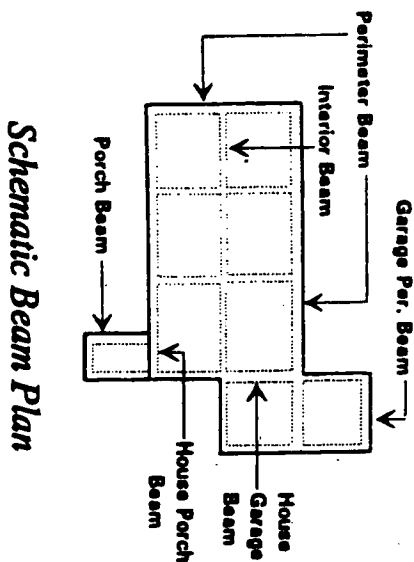
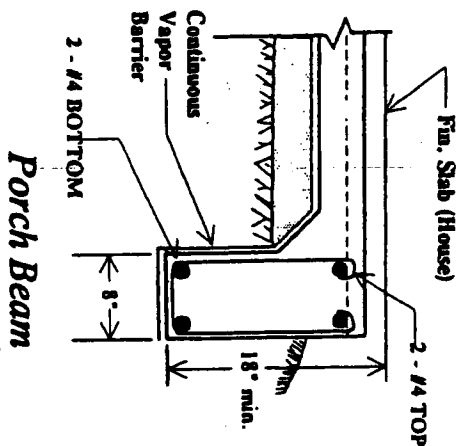
1. In any bay of 20 feet:
+/- 3/8 inch
In total length or width:
+/- 3/4 inch
2. To receive masonry construction:
 - a) Alignment in 10 feet:
+/- 1/4 inch
maximum for entire length:
+/- 1/2 inch
 - b) Level in 10 feet:
+/- 1/4 inch
maximum for entire length
+/- 1/2 inch

4" Concrete Slab w/ #3 bars @ 18" o.c. each way in the center of the slab; Bar reinforcing to start minimum 5" from edge.



General Notes

1. Use Sand Fill; except in area where high water table is encountered -- use gravel, crushed stone or compactible material.
2. Bottoms of all beams shall extend six inches minimum into undisturbed soil.
3. All Concrete shall have a 28 day minimum compressive strength of 3000 p.s.i.
4. No Dead-End beams allowed.
5. All beam reinforcing shall extend to within 1 1/2" of exterior forms.
6. All reinforcing to be continuous.
7. Beam reinforcing shall be tied and supported every 5' 0" minimum.
8. Lap all bar reinforcing 40 diameters.
9. Provide chairs or other suitable supports for slab reinforcing.
10. Plumbing may cross beams but not be placed in beams.
11. Garage & porch slabs shall be same as the house slab.
12. Reinforce porch beams with four - #4 Bars.
13. All reinforcing to have a minimum of 1 1/2" concrete cover.



Type A Slab Foundation Details

Note: 3 #5 rebar may be substituted for 2 #6 rebar.

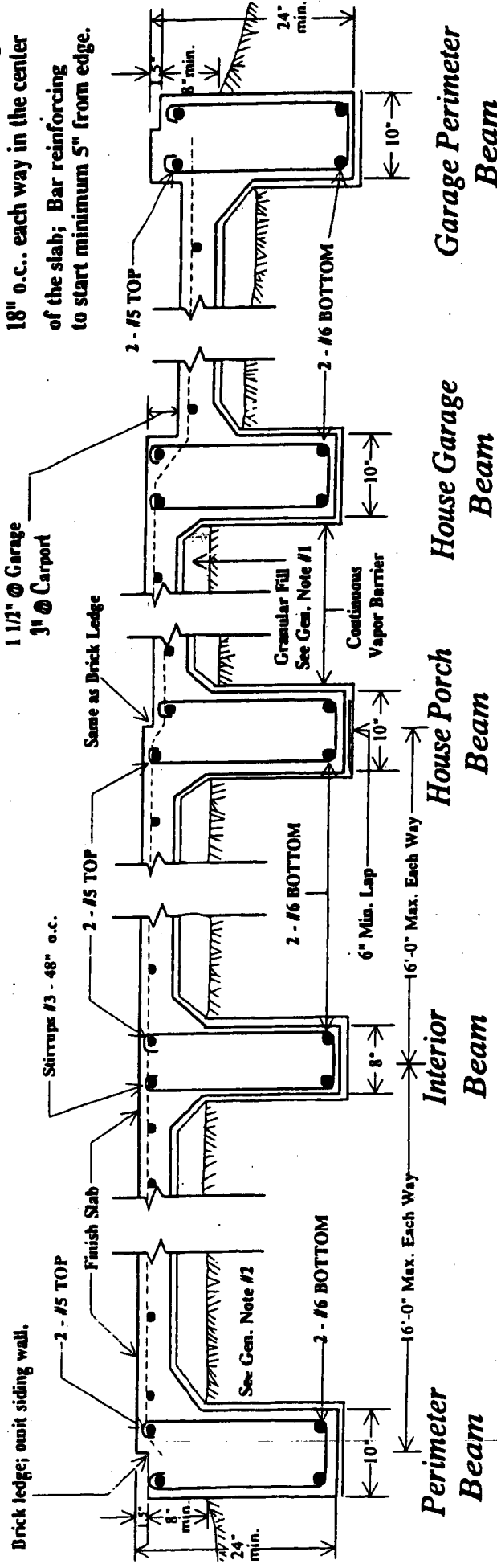
Special Note: Minimum acceptable design dependent upon soil and

For P.I. Range 0 to 15

Date: 8/92

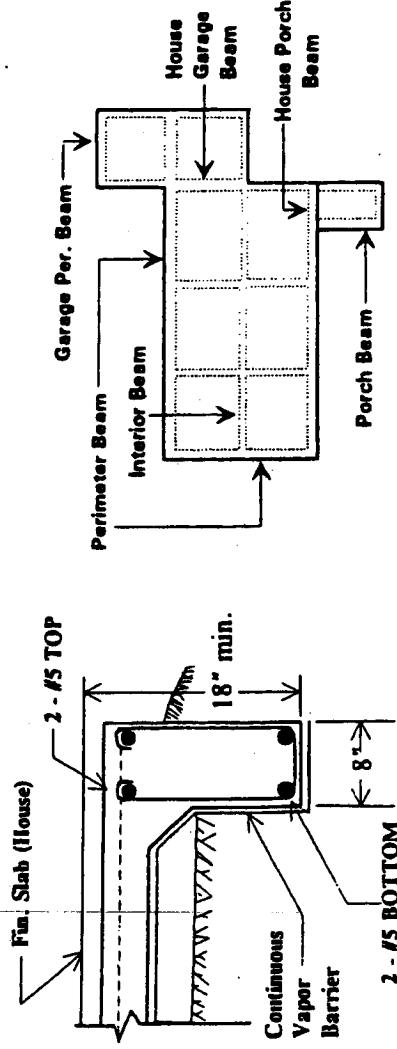
**Farmers Home
Administration
Temple, Texas**

4" Concrete Slab w/ #3 bars @ 18" o.c., each way in the center of the slab; Bar reinforcing to start minimum 5" from edge.



General Notes

1. Use Sand Fill; except in area where high water table is encountered -- use gravel, crushed stone or comparable material.
2. Bottoms of all beams shall extend six inches minimum into undisturbed soil.
3. All Concrete shall have a 28 day minimum compressive strength of 3000 p.s.i.
4. No Dead-End beams allowed.
5. All beam reinforcing shall extend to within 1 1/2" of exterior forms.
6. All reinforcing to be continuous.
7. Beam reinforcing shall be tied and supported every 4' 0" minimum.
8. Lap all bar reinforcing 40 diameters.
9. Provide chairs or other suitable supports for slab reinforcing.
10. Plumbing may cross beams but not be placed in beams.
11. Garage & porch slabs shall be same as the house slab.
12. Reinforce porch beams with four - #5 Bars.
13. All reinforcing to have a minimum of 1 1/2" concrete cover.



Schematic Beam Plan

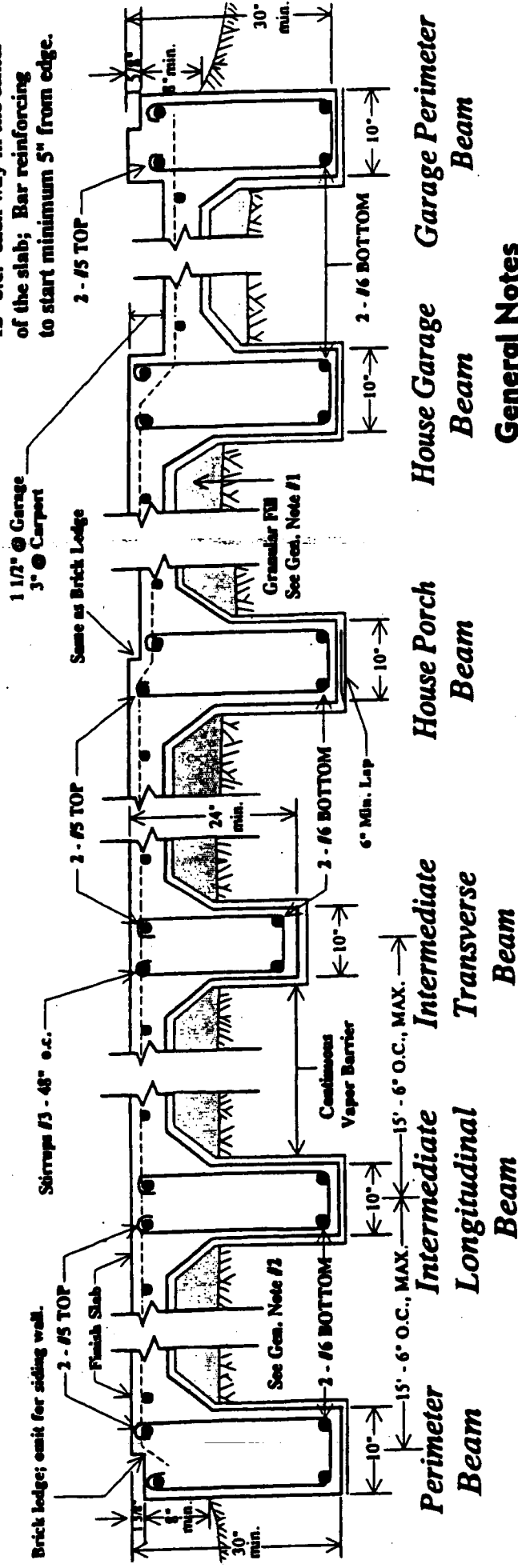
Note: 3 #5 rebar may be substituted for 2 #6 rebar.

Special Note: Minimum acceptable design dependent upon soil and engineering analysis submitted.

Type B Slab Foundation Details For P.I. Range 16 to 30

Farmers Home
Administration
Temple, Texas
Date: 8/92

5" Concrete Slab w/ #3 bars @ 12" o.c. each way in the center of the slab; Bar reinforcing to start minimum 5" from edge.

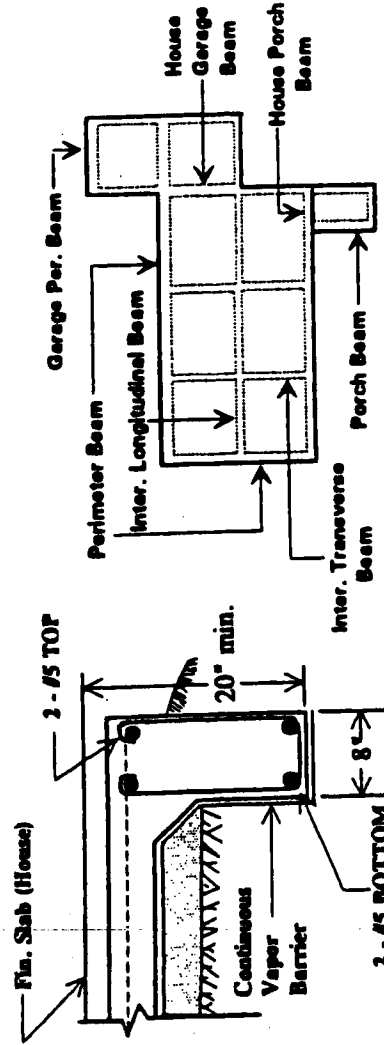


General Notes

1. Use Sand Fill; except in area where high water table is encountered -- use gravel, crushed stone or comparable material.
2. Bottoms of all beams shall extend six inches minimum into undisturbed soil.
3. All Concrete shall have a 28 day minimum compressive strength of 3000 p.s.i.
4. No Dead-End beams allowed.
5. All beam reinforcing shall extend to within 1 1/2" of exterior forms.
6. Beam reinforcing shall be tied and supported every 4' 0" minimum.
7. Lap all bar reinforcing 40 diameters.
8. Provide chairs or other suitable supports for slab reinforcing.
9. Plumbing may cross beams but not be placed in beams.
10. Garage & porch slabs shall be same as the house slab.
11. Reinforce porch beams with four - #5 Bars.
12. For house lengths more than 50' and up to 60' in length, provide 3 - #6 Bars in bottom and two #5 Bars in top of all longitudinal beams.
13. All reinforcing to be continuous
14. All reinforcing to have a minimum of 1 1/2" concrete cover.

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Date: 8/92

Type C Slab Foundation Details For P.I. Range 31 to 45



Schematic Beam Plan

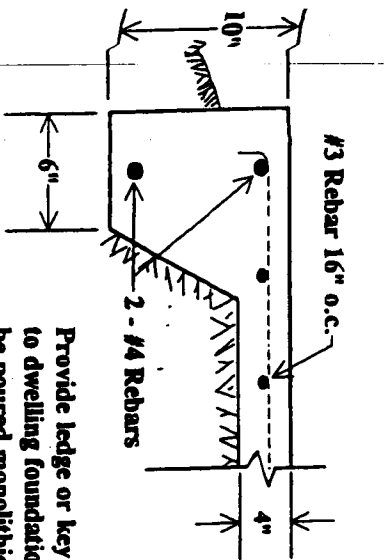
Porch Beam

Note: 3 #5 rebar may be substituted for 2 #6 rebar.

Special Note: Minimum acceptable design dependent upon soil & engineering analysis submitted.

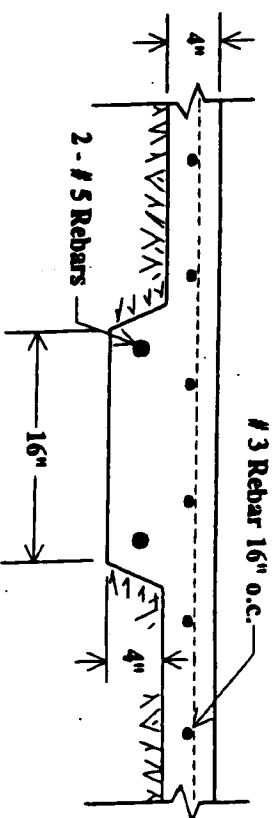
Perimeter Beam

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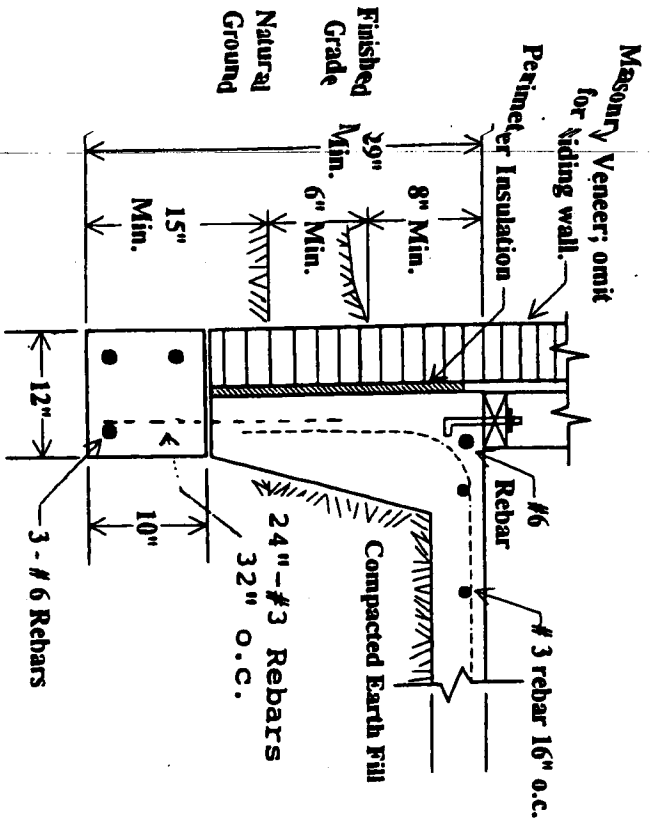


Provide ledge or key or dowel to dwelling foundation or may be poured monolithic with dwelling slab.

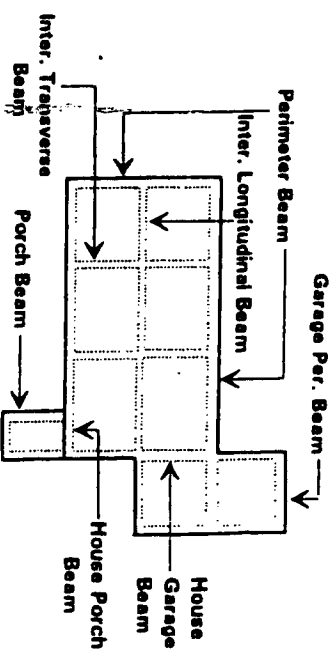
Porch & Terrace Thickened Edge



Thickened Slab - Bearing Partition



Perimeter Beam



Schematic Beam Plan

General Notes

1. Use Sand Fill; except in area where high water table is encountered -- use gravel, crushed stone or compactible material.
2. All Concrete shall have a 28 day minimum compressive strength of 3000 p.s.i.
3. No Dead-End beams allowed.
4. All beam reinforcing shall extend 40 within 1 1/2" of exterior forms.
5. Beam reinforcing shall be tied and supported every 4' minimum.
6. Lap all bar reinforcing 40 diameters.
7. Provide chairs or other suitable supports for slab reinforcing.
8. Plumbing may cross beams but not be placed in beams.
9. All reinforcing to be continuous.
10. All reinforcing to have a minimum of 1 1/2" concrete cover.
11. All perimeter beams shall extend a min. of 6" into undisturbed soil.

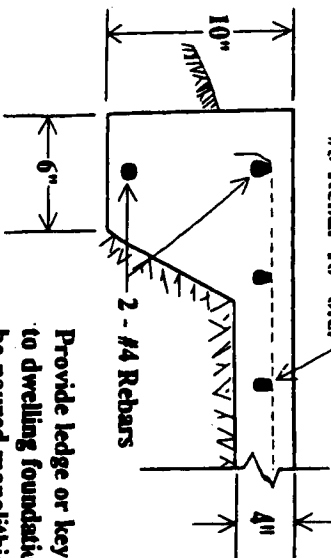
Amarillo Area

(Two Pour System)

Typical Slab Foundation

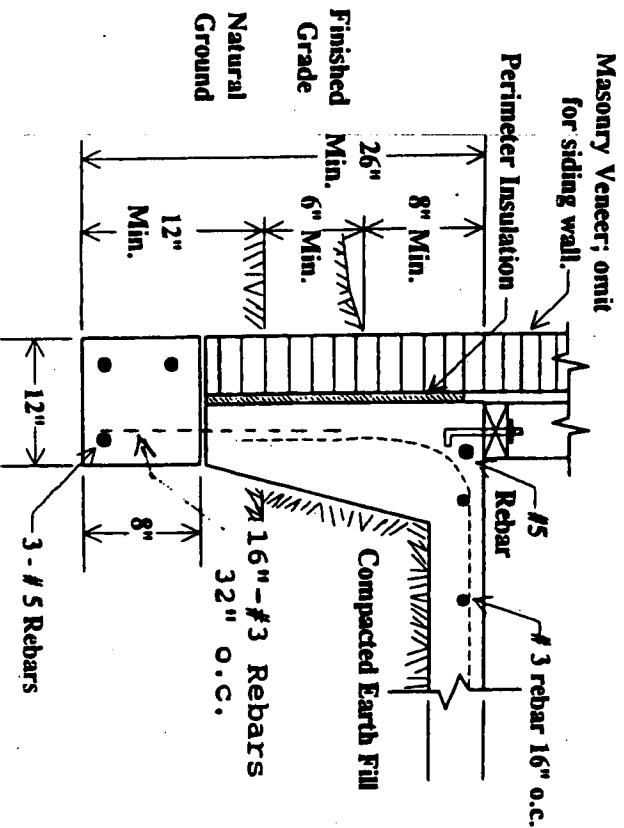
Special Note: Minimum acceptable design dependent upon soil and

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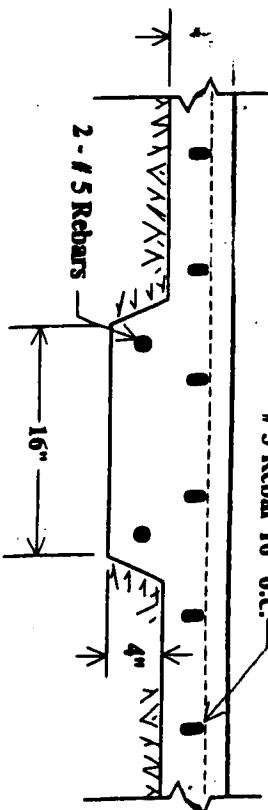
Provide ledge or key or dowel to dwelling foundation or may be poured monolithic with dwelling slab.

Porch & Terrace Thickened Edge

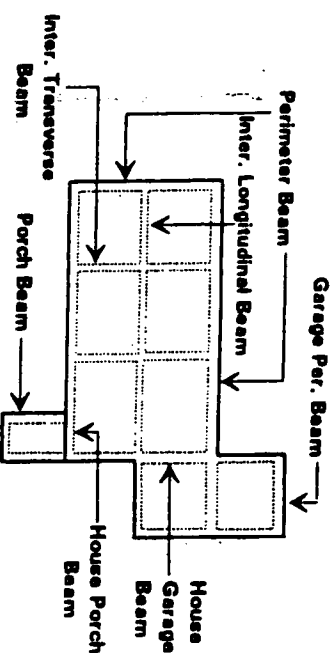


Perimeter Beam

Special Note: Minimum acceptable design dependent upon soil and engineering analysis submitted.



Thickened Slab - Bearing Partition



Schematic Beam Plan

General Notes

1. Use Sand Fill; except in area where high water table is encountered -- use gravel, crushed stone or comparable material.
2. All Concrete shall have a 28 day minimum compressive strength of 3000 p.s.i.
3. No Dead-End beams allowed.
4. All beam reinforcing shall extend to within 1 1/2" of exterior forms.
5. Beam reinforcing shall be tied and supported every 4' minimum.
6. Lap all bar reinforcing 40 diameters.
7. Provide chairs or other suitable supports for slab reinforcing.
8. Plumbing may cross beams but not be placed in beams.
9. All reinforcing to be continuous.
10. All reinforcing to have a minimum of 1 1/2" concrete cover.
11. All perimeter beams shall extend a min. of 6" into undisturbed soil.

Lubbock - Midland - Odessa (Two Pour System) Typical Slab Foundation

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